

Make Your Own Rock

Grade: 3-5

Time: 1 class period

Lesson #4A:

What Are Minerals?

Overview:

Students explore rock composition by making simulated edible or non-edible rocks using a variety of materials as “minerals”.

Essential Questions:

- What are rocks made of?
- What are properties of rocks and minerals?

Contents:

- Standards addressed
- Vocabulary
- Assessment
- Teacher Information and Procedure
 - Prior knowledge for students
 - Materials
 - What to do in advance
 - Teaching the lesson
 - Gear –up
 - Explore
 - Generalize
 - Assess
- Extensions, Adaptations, and more Resources

Source: Adapted from AMEREF Geology module “Rock Cookies”

Make Your Own Rock

Grades 3-5

1 class period

Overview:

Students explore the rock composition by making simulated rocks using simulated minerals.

Essential Questions:

- What are rocks made of?
- What are properties of rocks and minerals?

Assessment:

Can students classify rocks by their hardness?

Vocabulary

- rock
- mineral
- composition
- classify
- hardness
- texture

Alaska Standards Addressed:

Science GLEs

The student demonstrates an understanding of -geochemical cycles by:

[3] SD1.1 recognizing that most rocks are composed of combinations of different substances.

-the processes of science by:

[3] [4] [5] SA1.1 asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring and communicating.

[4] SA1.2 observing, measuring and collecting data from explorations and using this information to classify, predict, and communicate.

Teacher information and Procedure

Prior knowledge for students: They should be able to describe the texture of rocks (see 1A Rock Game)

Materials needed:

Per student:

- 3 small clear plastic cups
- Popsicle sticks
- 10 Dixie cups
- Three kinds of “Cementing” Materials:
 - Edible possibilities
 - Peanut Butter
(WARNING: Check to make sure no one is allergic)
 - Marshmallow Cream
 - Honey
 - “Particles, layers and minerals”:
 - Edible possibilities:
 - Chocolate chips
 - Coconut
 - White chips
 - Butter
 - Brown sugar
 - Powdered sugar
 - Graham crackers
 - Non-edible possibilities:
 - Sand
 - Small pebbles
 - Beads
 - Dirt
 - Chalk
 - Dry Beans
 - Styrofoam pellets
- 5 rocks – at least 2 must be the same kind of rock

What to do in advance: Put about 2 tablespoons of each ingredient into Dixie cups.

What to do during the lesson:

Gear up:

Discuss the idea that rocks come in many different shapes and sizes, but these don't help to determine the type of rock. Color, texture, and hardness do help determine the type of rock. Show two different sized pieces of granite to illustrate that a granite rock can be the size of a pebble, a rock, a boulder, or part of a mountain; however, all of those pieces of granite will be coarse grained, hard, light colored, without layers, and contain crystals.

From a pile of rocks, or on a walk outdoors, ask students to find two pieces of rock that are made of the same kind of “ingredients”. Ask students to show their rocks and explain why they think they are the same.

Explore:

- 1) Tell the students that they will be making 3 different kinds of “rocks”. They must make their rocks so that each one has at least one special quality that helps determine what it is. They must also name their rocks.
- 2) Demonstrate with the ingredients how to make 3 different “rocks”. On the board list each of the cementing materials. Tell them that each of their three rocks should have a different cementing material. Then they can use the other ingredients to make each of the 3 “rocks” different. Students can use as many ingredients in each “rock” as they like, however, each of the 3 should somehow be different than the others. Optional: You may want to challenge your students to make a really heavy rock and a really light rock.
- 3) Pass out the materials and let the students make their “rocks”. If using edible ingredients, tell them the “cookie rocks” may not be eaten until all the assignments are complete. When a rock is finished it can be placed in the cup.
- 4) After the “rocks” are made, have students name each of their three rocks.
- 5) Have students describe the observable properties of their rocks (color, hardness, and texture, etc). If all 3 rocks look the same, have them work on their rocks to try to make them different or make new rocks.
- 6) Finally have students look at a neighbor’s set of rocks, without touching them, and using their neighbor’s descriptions, try to guess which rock is which.

Generalize:

Ask the following questions:

- 1) How do your homemade rocks compare with real ones? What holds real rocks together? (huge amounts of heat and pressure underground help real rocks to form) Can you see the individual minerals in rocks? (sometimes) What other ingredients could you have used in your rocks?
- 2) How did your neighbors’ descriptions help you to identify the rocks?
- 3) Which of the following can help you to identify a type of rock: shape, size, color, texture, hardness, composition?

Assess:

Use steps 3-6 and the following to assess the students’ work.

Give each person 5 rocks. Have him or her tell how they are different in color, texture, and (observable) composition. Ask the student to find the 2 rocks in their pile which are the same type

Extensions, adaptations and more resources:

- Classify all of the rocks made by the whole class into different groups.

- Go on a “rock hunt” to find rocks that have particular properties: coarse-grained, fine-grained, white veins, pink color, black speckles, stripes, etc.